National Aeronautics and
Space Administration

Langley Research Center
100 NASA Road
Hampton, VA 23681-2199

May 8, 2009

Reply to Attn of: 494

TO: 106/Competition Advocate

FROM: 494/SAGE III Assessment Lead

SUBJECT: Justification for Other than Full and Open Competition (JOFOC) for SAGE III Spaceflight Instrument Assessment and Refurbishment

1. Recommendation

I recommend that the NASA Langley Research Center (LaRC) initiate a procurement with the Ball Aerospace and Technologies Corporation (BATC) to support assessment and refurbishment of a Stratospheric Aerosol and Gas Experiment (SAGE III) spaceflight instrument which has been in storage at the NASA Langley Research Center since January 2004.

An Indefinite-Delivery-Indefinite-Quantity (IDIQ) contract with BATC should be initiated for this support. The initial IDIQ contract task will be issued for BATC support of an assessment of the instrument which will be led by the NASA Langley Research Center. While there are no commitments of any kind regarding a potential flight opportunity for the SAGE III instrument at this time, if additional work is authorized and directed by NASA Headquarters, an IDIQ contract will permit the Government to issue task orders for further assessment of the instrument, for support of mission accommodation studies, and for instrument refurbishment and updates necessary for a flight mission. The maximum value of the contract is $9.7M.

2. Background

Scientists and engineers at NASA LaRC have pioneered the remote sensing of the Earth's atmosphere from space. Starting with the Stratospheric Aerosol Measurement (SAM) experiment performed as part of the Apollo-Soyuz flight in 1976, NASA LaRC scientists have developed robust climate trend quality data sets of ozone, aerosols, and other atmospheric trace gases based on the solar occultation measurement technique. BATC designed, developed, fabricated, qualified and calibrated the following occultation instruments whose data has been used to create this climate quality data set.

Stratospheric Aerosol Measurement II (SAM II: 1978 - 1993): The SAM II experiment flew aboard the Nimbus-7 spacecraft and provided vertical profiles of aerosol extinction in both the Arctic and Antarctic polar regions. The SAM II data coverage began on October 29, 1978 and extended through December 18, 1993 at which time SAM II was no longer able to acquire the Sun due to orbit degradation of the Nimbus satellite.

Stratospheric Aerosol and Gas Experiment (SAGE I: 1979 - 1981): The SAGE I experiment instrument was launched February 18, 1979, aboard the Applications Explorer Mission-B (AEM-B) satellite. The SAGE I instrument had four spectral channels and made nearly global measurement of aerosol extinction profiles and ozone and nitrogen dioxide concentration profiles. The SAGE I instrument collected data for almost three years until the AEM-B satellite power subsystem failed.

Stratospheric Aerosol and Gas Experiment (SAGE II: 1984 - 2005): The SAGE II sensor was launched aboard the Earth Radiation Budget Satellite (ERBS) in October 1984 and operated nearly flawlessly for twenty-one years until the ERBS satellite was decommissioned in 2005. SAGE II provided the scientific community with a global depiction of the changes in the distribution of aerosol, ozone, water vapor and nitrogen dioxide. Using these measurements, SAGE II contributed unique and crucial input to the understanding of global, seasonal and inter-annual variability in climate and, in particular, trends in stratospheric ozone.

Stratospheric Aerosol and Gas Experiment (SAGE III: 2001 - 2006): SAGE III is a fourth generation, satellite-borne instrument and a crucial element in NASA's Earth Observing System (EOS). The first SAGE III instrument was launched on December 10, 2001 on-board a Russian Meteor 3M spacecraft and operated until April 2006 when the spacecraft power system failed. SAGE III built on the heritage of the very successful SAGE II experiment with the incorporation of an advanced charge coupled device (CCD)-detector spectrometer. The new enhancements allowed the addition of lunar occultation and limb scattering measurements to complement the solar occultation measurements. Two additional SAGE III flight models were built in addition to the Meteor 3M flight unit. One unit, designed as a flight spare, was used for the Meteor 3M mission when a problem with the azimuth drive unit on the primary flight unit was found. The other SAGE III flight instrument was originally manifested to operate as an attached payload on the International Space Station. This unit has been in storage at NASA LaRC since 2004 when the ISS flight was cancelled due to the Columbia space shuttle accident and realignment of the ISS program.

Data from these instruments has been used as part of United Nations Environment Programme (UNEP)/ World Meteorological Organization (WMO) international ozone and aerosol trend assessments, supported studies of climate sensitivity to aerosol loading, and supported process studies using the measurement's high vertical resolution. SAGE data has been recognized as a critical measurement for long-term climate studies and ozone trend assessments. In the 2008 Bjerknes Lecture at the American Geophysical Union Meeting in San Francisco California, Dr. James Hansen, a world-renowned climate scientist, referred to the spare SAGE III flight instrument when he stated "...we must measure aerosols with the required accuracy, which none of the current satellite instruments have. The instrument that can measure stratospheric aerosol properties with great accuracy is sitting on a shelf at Langley Research Center." The

Earth Science Subcommittee of the NASA Advisory Council agreed with Dr. Hansen's recommendation at a meeting on January 7-8, 2009 at NASA Headquarters and recommended that Earth Science Division examine the implications for Decadal Survey implementation of launching a SAGE-III/ACE stratospheric profiling mission in 2013.

On March 31, 2009, NASA Headquarters approved a NASA LaRC proposal to conduct an assessment of the SAGE III instrument that has been in storage. The purpose of the assessment is to obtain data necessary to assess the readiness of the instrument for re-flight options and to identify additional work necessary to make the SAGE III instrument flight-ready. While NASA Headquarters has approved this initial assessment, no additional commitments of any kind regarding potential flight opportunities for the instrument were made.

3. Description of Required Supplies and Services

To address these needs, an IDIQ contract with Ball Aerospace and Technologies Corporation is required to support assessment of the SAGE III instrument and to support refurbishment of the instrument for a flight mission if directed by NASA management.

The Government will issue an initial task order for assessment of the instrument's lubrication system and for consulting and documentation support. Additional task orders for mission accommodation studies, mission definition studies, the definition of detailed interfaces and implementation of instrument refurbishment (including the development of design changes or updates, plans, procedures, environmental testing, and support of satellite integration) may be issued at a later date.

4. Statutory Authority

Provisions for this JOFOC are made under the statutory authority of 10 U. S .C. 2304 (c)(l) as implemented by FAR 6.302-1, "Only One Responsible Source and No Other Supplies or Services will Satisfy Agency Requirements." Pursuant to FAR 6.302-1(a)(2)(ii), expertise to support the SAGE III instrument is available only from the original research and development source of the SAGE III Instrument, BATC. Award of this contract effort to any other source would result in substantial duplication of cost to the Government that could not be recovered through competition.

5. Contractor's Unique Qualifications

NASA LaRC has previously contracted with BATC for the development of the earlier SAGE II and SAGE III instruments. Through this work, BATC has developed unique and world-class expertise in space-based solar/lunar occultation instruments. As the original SAGE III instrument prime contractor, BATC produced the SAGE III instrument which will be assessed and possibly refurbished under the proposed contract. BATC therefore has intimate and unique familiarity with the SAGE III instrument as well as a long history producing similar instruments. BATC also has the unique engineering, manufacturing, and other processes necessary to perform the proposed work. BATC is intimately familiar with the design, assembly, subsystem interaction, overall function, and calibration of the SAGE III instrument

since BATC designed, built, and demonstrated this capability based on previous SAGE III efforts with LaRC. While the Government strives for complete "as built" documentation, the degree of insight gained through actual hands on experience cannot be provided by a source other than BATC without incurring significant cost and schedule impacts and significant technical risk to the instrument. BATC's engineering and instrument development processes are proprietary and are not available as part of the instrument design package. The legacy knowledge and unique facilities which BATC can bring to bear in assessing and refurbishing the SAGE III instrument cannot be duplicated by any other company without extensive time and the resulting additional costs for study and familiarization with the instrument, including its design and operating characteristics.

6. Potential Sources

Because of BATC's unique and intimate familiarity with the SAGE III instrument, BATC is the only source which could provide support to assess and refurbish that instrument. It would not be practical or efficient for any other source to expend the extensive effort, time, and cost to become sufficiently familiar with the instrument to perform the work. In addition, any firm other than BATC would add risk to the technical results because of their lack of in-depth knowledge and familiarity with the instrument.

7. Demonstration That The Nature of the Acquisition Requires the Use of the Authority Cited

Soliciting offers from other sources is not deemed practical since BATC is the only source that possesses the ability to assess and refurbish this heritage instrument without an extensive and unnecessary expenditure of cost and time.

8. Synopsis of the Procurement

Following approval of this JOFOC, a synopsis of NASA's requirement will be published via NASA Acquisition Internet Service (NAIS) and FedBizOpps announcing the Government's intention to negotiate only with BATC.

9. Determination By the Contracting Officer That the Anticipated Cost to the Government Will Be Fair and Reasonable

A cost analysis will be performed as described in FAR 15.4. BATC will be required to submit a proposal that will be evaluated and negotiated by the Government. All sources such as Defense Contract Audit Agency (DCAA) and Government technical representatives will be utilized in the determination of a fair and reasonable cost. In addition, historical data established under the previous BATC SAGE III contract will be used for cost comparisons where applicable.

10. Description of the Market Research Conducted

Langley Research Center has many experts in solar/lunar occultation instruments such as SAGE III. These experts attend and present at conferences, stay abreast of the literature (reports, technical and scientific journals) and are aware of industry capabilities and advancements in the field. It was determined that while potential sources other than BATC exist that might be able to provide a similar level of research, development, and engineering support, none of these potential sources have the unique knowledge, familiarity, and expertise to perform the work. This work is complex and highly specialized and award to any other source would result in substantial duplication of cost to the Government that is not expected to be recovered through competition.

11. Any Other Facts Supporting the Use of Other Than Full and Open Competition

None.

12. List of the Sources, If Any, That Expressed, in Writing, an Interest in the Acquisition

None.

13. Statement of the Action, If Any, the Agency May Take to Remove or Overcome Any Barriers to Competition Before Any Subsequent Acquisition For the Supplies or Services Required

No further SAGE III procurements are anticipated.

Technical Certification

I certify that to the best of my knowledge and belief, the data presented in this justification is accurate and complete.

Michael S. Cisewski
SAGE III Assessment Lead

5-8-2009
Date

Contracting Officer Certification

I hereby determine that the anticipated cost to the Government will be fair and reasonable and certify that this justification is accurate and complete to the best of my knowledge and belief.

Lisa M. Harvey
Contracting Officer

5/8/09
Date

Concurrence:

Michael I. Mark
Office of Chief Counsel

8 MAY 09
Date

Virginia C. Wycoff
Procurement Officer

5/8/2009
Date

Approval:

Stephen G. Jurczyk
Competition Advocate

5/12/09
Date

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